Asthma Surveillance Report

MONTANA ASTHMA CONTROL PROGRAM

October-December 2010

Occupational and Work Aggravated Asthma

More than 250 agents have been identified as being involved in the development of occupational asthma

Source: Evidence Report/Technology Assessment: Diagnosis and Management of Work-Related Asthma

Please note that the correct percent for Table 2, Pets in the Bedroom in the surveillance report "Environmental Exposures and Asthma" is 51% (45.7-56.2) for adults and 46.7% (36.7-56.7) for children. We apologize for the error.

Occupational and Work Aggravated Asthma

The workplace can be a source of asthma and workplace exposures can trigger or aggravate asthma. Occupational asthma (OA) is asthma that is 'due to causes and conditions attributable to a particular occupational environment and not to stimuli encountered outside the workplace'.[1] OA is further divided into two categories, with latency and without latency. No latency OA is an acute onset reaction and occurs less frequently. More frequently, OA has a latency period which may be days or weeks or even years in duration. OA has become one of the most prevalent occupational lung diseases in developed countries.[2] Work-aggravated asthma refers to 'preexisting or concurrent asthma that is exacerbated by workplace exposure'.[3] Work-related asthma refers to asthma that is caused or aggravated by the work environment.

Several recent studies have tried to estimate the frequency of work-related asthma in the US.[4-6] Due to the difficulty in identifying OA, it has been suggested that OA is more common than often reported. This report is an overview of the known causes of work-related asthma and data available on the frequency of self-reported work-related asthma in Montana.

Quantifying Work Related Asthma in Montana

The Montana Asthma Call-back Survey is a telephone survey of non-institutionalized adults aged 18 and over. Participants are recruited from the Behavioral Risk Factor Surveillance System survey telephone respondents if they indicate that they either had or currently have asthma. These individuals are then called again and asked more in-depth questions about their experience with asthma. Montana has participated in this call-back survey, sponsored by the Centers for Disease Control and Prevention, annually since 2006.

The Asthma Call-back Survey includes several questions on work related asthma inquiring as to whether a person's asthma was caused or aggravated by a current or previous job and whether a health care provider has told them their asthma is due to the work environment. A final question asks if the person ever left a job because of an occupational cause or aggravation of their asthma. The data shown in this report are from responses collected from 2006 to 2009. Only responses from people reporting having ever been employed were included in the analysis.

Identifying Causes and Diagnosing Work-Related Asthma

While there is no definitive test for OA, there are tools and tests to help identify OA.

Specific inhalation challenge (SIC): considered the 'gold standard' despite the chance of a false negative or positive result. This test involves exposing a worker to the suspected irritant at varying doses in a controlled environment. There are several methods for conducting this test.

History and questionnaires: assess specific job duties and ask about symptom improvement on weekends or days off as well as history of the temporal aspects of the disease. See Table 2 for occupations commonly linked to OA.

Serial lung function testing: comparing lung function tests at work and away from work. However this can be very time consuming as many readings are needed throughout the day for many days in a row.

Non-specific bronchial provocation testing: similar to SIC but is cheaper and easier. A positive test however only indicates hyper reactivity and is not definitive of OA. Serial testing can be performed while at and away from work.

Immunological testing: usually through skin prick test or estimation of specific IgE/IgG. Sensitization to a workplace exposure is possible while not having OA.

Measures of airway inflammation: exhaled nitrous oxide may be a manner to test for OA, but has not been validated. Another test of inflammation is sputum induction to look for specific immunological markers.

For more information see: Evidence Report/Technology Assessment: Diagnosis and Management of Work-Related Asthma[2]

Table 1. Definitions of work-related asthma[2]

Occupational asthma with latency of allergic or presumed immunological mechanism	There is an immunologic/ hypersensitivity component and the diagnostic tests include measures of specific sensitization (e.g. specific inhalation challenge, skin prick test, serum specific IgE).
Occupational asthma without latency	There is no allergic component and the worker is not 'sensitized' to an agent, but rather, the agent causes an inflammatory response through an irritant mechanism.
Work-aggravated asthma (no latency period)	The worker has a previous or concurrent history of asthma that was not induced by an exposure found in the workplace. The worker is not sensitized to an agent at work, but is irritated by a 'non-massive' exposure (e.g. cold, exercise, non-sensitizing dust, fumes, or sprays) that provokes an asthmatic reaction.

The estimated cost of OA in the US is $1.6 billion annually[7]

Table 2. Major causes of occupational asthma and workers at risk[8]

Cause	Type of Worker
Acrylate	Adhesive handlers
Amines	Shellac and lacquer handlers, solders
Anhydrides	Users of plastics, epoxy resins
Animal-derived allergens	Animal handlers
Cereals	Bakers, millers
Choramine-T	Janitors, cleaners
Di-isocyantes	Spray painters; insulations installers; manufacturers of plastics, rubbers and foam
Drugs	Pharmaceutical workers, health professionals
Dyes	Textile workers
Enzymes	Detergent manufacturers, pharmaceutical workers, bakers
Fluexes	Electronic workers
Formaldehyde, glutaraldehyde	Hospital staff, fabric, carpet, insulation handlers
Gums	Carpet makers, pharmaceutical workers
Latex	Health professionals
Metals	Solderers, refiners
Persulfate	Hairdressers
Seafood	Seafood processors
Sulfites	Restaurant or grocery store workers
Wood dusts	Forest workers, carpenters, cabinetmakers

Table 3. Self-reported work-related asthma among people with current asthma, 2006-2009, Montana		
	Percent	95% Confidence Interval
Caused by current or previous job	44.2	39.3-49.1
Aggravated by current or previous job	35.6	30.8-40.3
Caused or aggravated by current job	21.6	17.2-26.1
Caused or aggravated by previous job	39.5	34.8-44.3
Quit or changed job because it caused or made asthma worse	10.6	7.5-13.7
Ever told by/to a health care provider that asthma is work related	15.5	12.2-17.8
Potentially work-related*	51.8	46.9-56.7

***'Yes' response to any of the 7 questions about work related asthma**

Work Related Asthma in Montana

- About 52% of Montanans with current asthma report that their disease is potentially work-related (Table 3).
- Fifteen percent of adult Montanans with current asthma report being told by or telling a health care provider that their asthma is work related (Table 3).
- About 1 in 9 people with current asthma report having had to change or quit a job because it made their asthma worse (Table 3).
- Of people with current asthma who reported that they have been told by a health care provider that their asthma is related to any job they have had:

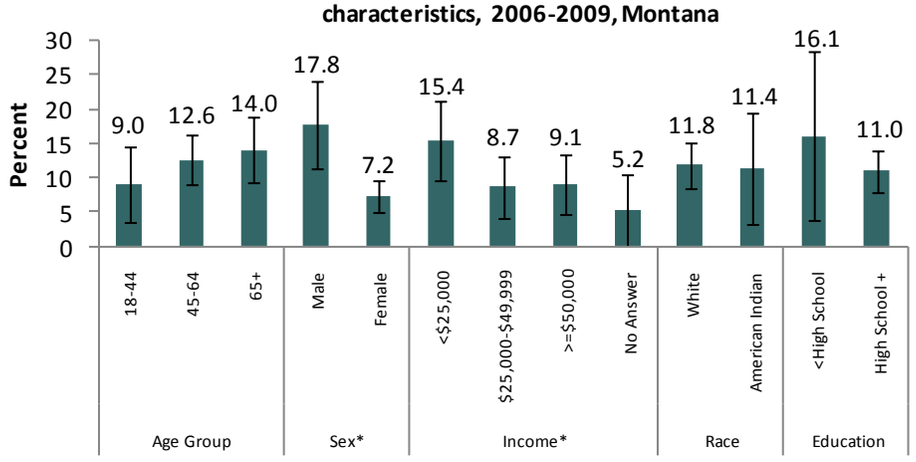
⇒ As age increases, the proportion of persons who report work-related asthma increases, though not statistically significant (Figure).

⇒ Men are significantly more likely to report being told by a health care provider that their asthma is related to work than are females (Figure).

⇒ The frequency of work-related asthma was highest among people with an annual income of less than $25,000 (Figure).

⇒ There was no significant difference in the frequency of work-related asthma by race or education level (Figure).

Figure. Percent of people with work related asthma† by selected characteristics, 2006-2009, Montana



* Statistically significant P<0.05

† Reported currently having asthma and that a health care provider told them their asthma is related to any job they have had

Discussion and Key Clinical Recommendations

New onset of asthma and reactivation of asthma has been shown to be associated with occupational factors in about 1 in 10 cases of adult asthma.[9] In Montana, over 50% of adults with asthma report their asthma was potentially work-related. With a large number of products that contribute to OA it is important to help patients identify triggers of their asthma and to avoid those triggers. While not easy to identify definitively, there are a variety of tests available to help diagnose OA.

- Take thorough history of temporal trends of asthma symptoms for patients with asthma and consider OA for adult onset asthma.
- Work with patients to identify ways to reduce or remove exposures at work.
- No test for OA has been shown to be definitive, therefore consider using a combination of tests to diagnose OA.
- Contact the Montana Asthma Control Program for more information at 406-444-7304.

Footnotes

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3. Wagner G. Wegman D. Occupational Asthma: Prevention by definition. *American Journal of Industrial Medicine 33:427-429, 1998*
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7. Leight JP, RomanoPS, Schenker MB *et al*. Costs of Occupational COPD and Asthma. Chest 2002;121:264-72.
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9. Blanc PD, Toren K. How much adult asthma can be attributed to occupational factors: *Am J med*. 1999 Dec;107(6):580-7.

For more information, visit the Asthma Control Program website: http://dphhs.mt.gov/asthma

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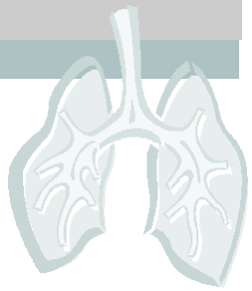

Quarterly Surveillance Report

MONTANA
ASTHMA CONTROL PROGRAM

October-December 2010

Work-Related Asthma

LOOK INSIDE FOR INFORMATION ON:

- Common causes of work-related asthma
- Percent of self reported work-related asthma in Montana
- Prevalence of work-related asthma by selected characteristics
- Suggestions for helping your patients address work -related asthma

The Montana Asthma Control Program is funded through the Montana State Legislature and the Centers for Disease Control and Prevention. The goal of the program is to improve the quality of life for all Montanans with asthma. For more information, visit our website at http://dphhs.mt.gov/asthma

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3750 copies of this public document were published at an estimated cost of $0.22 per copy, for a total cost of $825.00, which includes $825.00 for printing and $0.00 for distribution. This publication was supported by the Cooperative Agreement Number CDC-RFA-EH09-901 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.